



Bristol-Myers Squibb

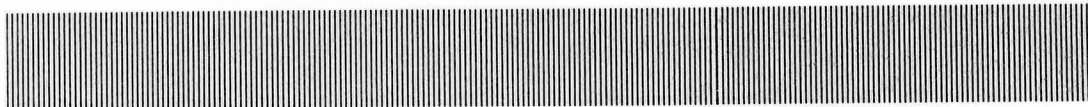
Bristol-Myers Squibb Manufacturing Company

Rt. 3, km 775 • Humacao, Puerto Rico 00791

Interim Corrective Measure Building 5 Area

Soil Treatment Cell Closure Certification Report

April 2008



Report Prepared By:

MP Engineers of Puerto Rico

Las Vistas Shopping Village #300
Avenida Felisa, Rincon, Suite 23
San Juan, Puerto Rico 00926-5956
(787) 755-1919

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Bristol-Myers Squibb

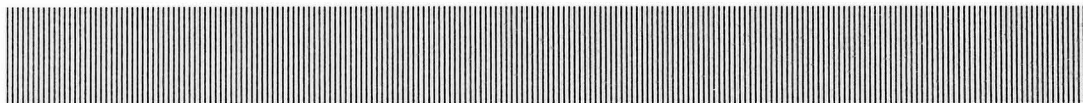
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1. Background Information

1.1. General Facility Description

Bristol-Myers Squibb Manufacturing Company (BMSMC) is a facility located in the Commonwealth of Puerto Rico at State Road #3, Km 77.5 in Humacao. BMSMC is a publicly held corporation with principal offices in New York City, New York. A Site Vicinity Map is included as Figure 1-1.

BMSMC operates a pharmaceutical manufacturing facility which produces drugs for human consumption. The facility has been in operation since 1972. The BMSMC Plant consists of a number of production buildings and supporting facilities including waste treatment facilities. The site consists of approximately 48 acres.

BMSMC developed the *Interim Corrective Measure Work Plan, Building 5 Area (Revision 1.0)*, Bristol-Myers Squibb Manufacturing Company, Humacao, Puerto Rico, Revision 1.0 dated August 2004 (Work Plan). The Work Plan was prepared by Anderson, Mulholland, & Associates (AMAI) for the implementation of an Interim Corrective Measure (ICM) at the “Building 5 Area” which was designated by the U.S. Environmental Protection Agency (EPA) as Solid Waste Management Unit No. 20. The ICM is part of a RCRA Corrective Action Program being implemented at the Humacao facility in accordance with the terms of BMSMC’s RCRA Permit.

1.2. Project Description

Building 5, which became operational in 1972, is the former BMSMC bulk chemical manufacturing facility. During a RCRA Facility Investigation (RFI) at the Building 5 Area, completed in 1997 as part of the RCRA Corrective Action Program, it was determined that underground process waste transfer pipes formerly located at the northeast corner of Building 5 had leaked and released hazardous constituents to the subsurface. The pipes were removed during an underground storage tank closure completed in 1987. The release of hazardous constituents from the piping system resulted in impacts to subsurface soil and groundwater in the Building 5 Area.

BMSMC is currently implementing an ICM to address source area soil at the Building 5 Area. Phase I of the ICM, which involved excavation, treatment, and reuse or off-site disposal of approximately 1,800 cubic yards (cy) of impacted soil (“Area A” soil) was completed in March 2007. Phase 2 of the ICM, which involved the excavation, treatment and off-site disposal of approximately 2,000 cy of impacted soil (“Area B” soil) was completed in March 2008. Ex-situ biodegradation treatment included placement of



SQUIBB FACILITY

BIOPILE

0 0.1 0.2 Miles



March 2008 2451-136

Bristol-Myers Squibb Manufacturing Company
Humacao, Puerto Rico

Interim Corrective Measure
Biopile Closure Certification Report

FIGURE 1-1
SITE VICINITY MAP

excavated soils in a 60 mil lined HDPE (high density polyethylene) soil treatment cell (biopile). Additional phases of soil excavation are proposed.

In February 2008, MPPR was involved with oversight of the removal and off-site disposal of the Area B treated soil contained within the biopile as non-hazardous waste and the subsequent closure of the soil treatment cell and associated equipment. Aeration system components external to the biopile were disconnected and disposed of and the biopile cover system was also removed and co-disposed with the treated soil. All treatment system components within the biopile (i.e., perforated piping, soil gas monitors, tubing) as well as the gravel drainage layer underlying the treated soil were loaded onto trucks and disposed to an off-site industrial landfill.

As stated in the ICM Work Plan Section 4.6, MPPR was contracted by AMAI to serve as the project's Puerto Rico licensed Professional Engineer (P.E.) responsible for certifying that closure activities were performed as per regulatory requirements. MPPR's role in the project was to certify that the soil treatment cell was closed in a manner that achieves closure performance standards and in accordance with the provisions of the EPA-approved ICM Work. Mr. Jaime Abreu is the registered and qualified P.E. that has inspected and verified closure activities and procedures, and is certifying that activities were properly conducted. Mr. Abreu's P.E. credentials are included in Appendix A.

BMSMC subcontracted the services of Clean Harbors to be the contractor responsible for the removal of the soil from the treatment cell and off-site disposal of the treated soil and associated materials. Additionally, BMSMC subcontracted the services of AMAI to collect confirmatory soil samples and to provide general consulting services related to the Building 5 Area ICM. AMAI subcontracted Accutest Laboratories (Accutest) of Dayton, New Jersey to perform the required laboratory analyses.

MPPR's scope-of- work was organized into the following tasks:

- Provided periodic oversight of the dismantling of the biopile to ensure work was performed in accordance with the provisions of the EPA-approved ICM Work Plan Section 4.6.
- Conducted a detailed inspection of the soil treatment cell liner for rips, tears or other conditions which may have allowed the escape of hazardous constituents to subsurface soil.
- Provided oversight of AMAI during collection of confirmatory soil samples.
- Prepared a report summarizing the closure activities described above to certify that closure of the biopile achieved closure performance standards set forth in the Work Plan and at 40 CFR 264.111.

2. Summary of Site Inspections

MPPR conducted site inspection activities from February 15 to 28, 2008 (Monday to Friday). A water resistant field book was maintained by MPPR to record pertinent information regarding site inspection activities. Logbook pages were signed and dated by the person recording the information. The photographs taken by MPPR during the site inspections are included in Appendix B. The field notes are included in Appendix C.

2.1. Oversight of Soil Removal

The ICM involved excavation of contaminated soil from an area east of Building 5 and placement of the soil in an on-site soil treatment cell (“biopile”) for treatment by ex-situ biodegradation.

MPPR provided periodic oversight of the removal from the soil treatment cell of Area B soils and the subsequent biopile closure to ensure that work was being performed in accordance with the provisions of the Work Plan. Soil removal activities began on February 15, 2008 and continued, Monday to Friday, until February 28, 2008. MPPR conducted inspections of field activities each day of soil removal. MPPR’s inspections included an evaluation of the cover system to ensure that all components that may have contained impacted soil and the treated soil itself were properly removed from the biopile and shipped off-site for disposal.

MPPR also evaluated whether the project area was properly lined and that stormwater runoff controls were in place to prevent migration of treated soil. MPPR observed that a flexible membrane was placed over the ground surface and that the membrane was composed of high density polyethylene. The soil treatment cell is surrounded by a 12-inch high earthen berm to prevent the run-on of precipitation from adjacent areas and runoff of precipitation from the biopile.

BMSMC contracted Clean Harbors to remove the treated soil from the biopile and Asoc. Camioneros Yabuccoa to transport it off-site for non-hazardous disposal at a permitted landfill. Clean Harbors utilized a CAT 3200 excavator to remove the soil from the treatment cell and loaded directly into dump trucks for disposal off-site. As indicated in Table 2-1, excavated materials including soil and equipment associated with biopile construction, were disposed off-site from February 18, 2008 to February 29, 2008. In total, 2,224 cubic yards of material was disposed off-site at the Waste Management Sanitary Landfill located at Carr. 923, Km 7.1, Bo. Buena Vista, Humacao, Puerto Rico. The Waste Management Humaco landfill is a RCRA Subtitle D compliant landfill.

Table 2-1
Waste Disposal Summary
Bristol Myers Squibb Manufacturing Company
Humacao, Puerto Rico

[illegible]

Table 2-1
Waste Disposal Summary
Bristol Myers Squibb Manufacturing Company
Humacao, Puerto Rico

Manifest Date	Waste Description Taken From Manifest	Dump Truck (Mt ³)	Soil Weight(Tons)	Manifest #	Hauler	Disposal Destination
2/18/2008	Biopile Treated Soil	17	17.75	ICM-C-060	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	17.26	ICM-C-061	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	13.27	ICM-C-062	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	15.58	ICM-C-063	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	18.91	ICM-C-064	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	17.7	ICM-C-065	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	19.08	ICM-C-066	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	18.09	ICM-C-067	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	18.13	ICM-C-068	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	17.62	ICM-C-069	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	20.36	ICM-C-070	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	22.57	ICM-C-071	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	21.2	ICM-C-072	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	22.05	ICM-C-073	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	21.35	ICM-C-074	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	20.12	ICM-C-075	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	20.72	ICM-C-076	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	19.51	ICM-C-077	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	18.98	ICM-C-078	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	18.81	ICM-C-079	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	17.13	ICM-C-080	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	18.23	ICM-C-081	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	18.88	ICM-C-082	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	20.77	ICM-C-083	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	17.29	ICM-C-084	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	18.89	ICM-C-085	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	18.79	ICM-C-086	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	20.31	ICM-C-087	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	20.08	ICM-C-088	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	18.43	ICM-C-089	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	18.93	ICM-C-090	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	21.06	ICM-C-091	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	18.64	ICM-C-092	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	19.96	ICM-C-093	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	17.92	ICM-C-094	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	18.47	ICM-C-095	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	17.82	ICM-C-096	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	20.16	ICM-C-097	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	17.67	ICM-C-098	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	18.95	ICM-C-099	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	19.43	ICM-C-100	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	19.22	ICM-C-101	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	18.77	ICM-C-102	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	18.33	ICM-C-103	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	15.51	ICM-C-104	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	16.51	ICM-C-105	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	19.59	ICM-C-106	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	17.6	ICM-C-107	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	17.68	ICM-C-108	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	18.69	ICM-C-109	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	18.11	ICM-C-110	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	17.69	ICM-C-111	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	19.84	ICM-C-112	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	16.42	ICM-C-113	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	17.07	ICM-C-114	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/19/2008	Biopile Treated Soil	17	18.16	ICM-C-115	Asoc. Camioneros Yabucoa	WM Sanitary Landfill

Table 2-1
Waste Disposal Summary
Bristol Myers Squibb Manufacturing Company
Humacao, Puerto Rico

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Table 2-1
Waste Disposal Summary
Bristol Myers Squibb Manufacturing Company
Humacao, Puerto Rico

Manifest Date	Waste Description Taken From Manifest	Dump Truck (Mt ³)	Soil Weight(Tons)	Manifest #	Hauler	Disposal Destination
2/23/2008	Biopile Treated Soil	17	17.69	ICM-C-175	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/23/2008	Biopile Treated Soil	17	16.08	ICM-C-176	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/26/2008	Biopile Treated Soil	17	14.44	ICM-C-177	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/26/2008	Biopile Treated Soil	17	15.75	ICM-C-178	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/26/2008	Biopile Treated Soil	17	16.61	ICM-C-179	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/26/2008	Biopile Treated Soil	17	15.68	ICM-C-180	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/26/2008	Biopile Treated Soil	17	14.51	ICM-C-181	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/26/2008	Biopile Treated Soil	17	15.74	ICM-C-182	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/26/2008	Biopile Treated Soil	17	17.69	ICM-C-183	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/26/2008	Biopile Treated Soil	17	17.11	ICM-C-184	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/26/2008	Biopile Treated Soil	17	15.06	ICM-C-185	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/26/2008	Biopile Treated Soil	17	19.96	ICM-C-186	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/26/2008	Biopile Treated Soil	17	11.38	ICM-C-187	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/29/2008	Biopile Treated Soil	17	1.72	ICM-C-188	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
2/29/2008	Construction Debris	17	10.86	ICM-C-189	Asoc. Camioneros Yabucoa	WM Sanitary Landfill
Total Amount Disposed			3,178	Tons		
Estimated Volume Disposed			2,224	cu. yds.		

2.2. Inspection of the Soil Treatment Cell Liner

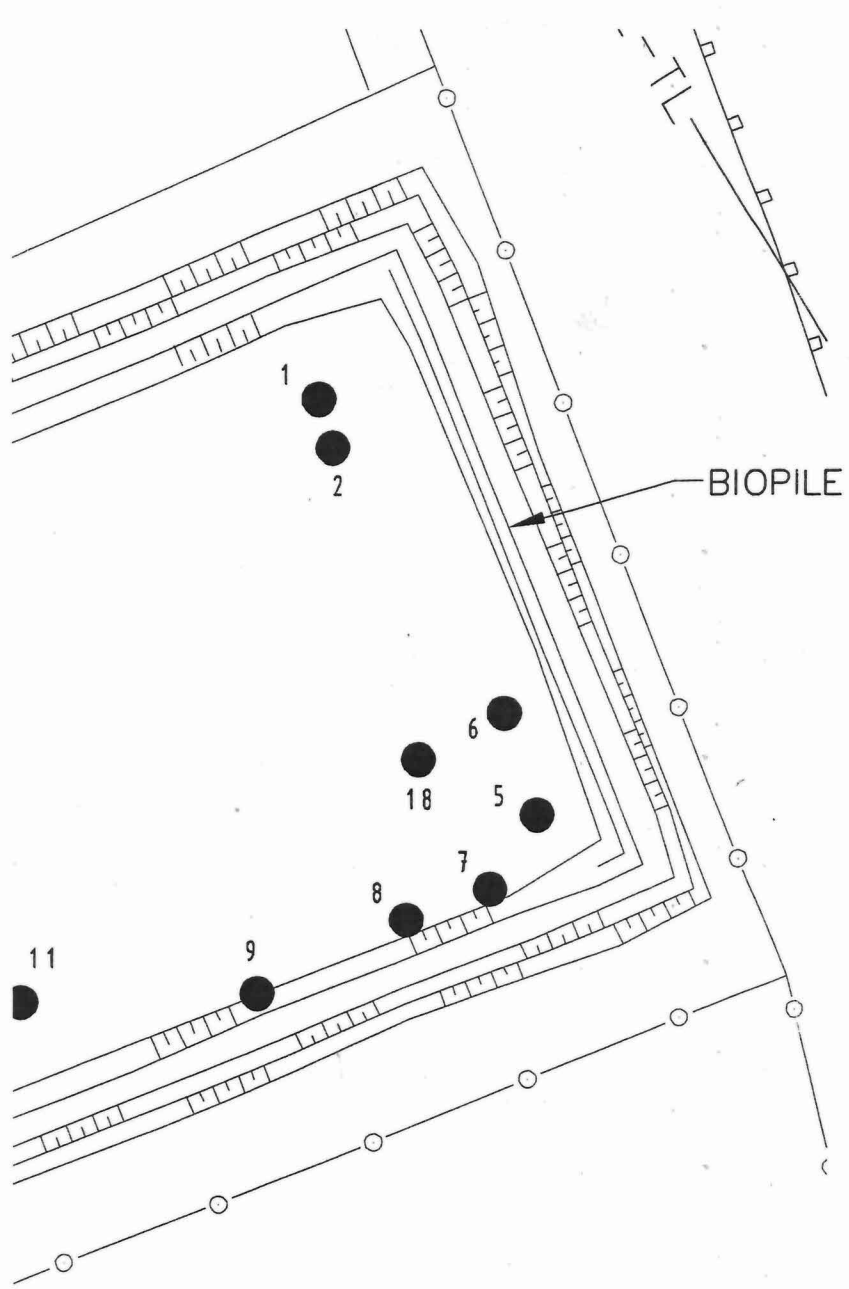
After the removal of the gravel drainage layer, MPPR performed a detailed inspection of the liner. MPPR identified and documented rips, tears, or other conditions that could have impacted the subsurface soil located beneath the liner. Rips and tears in the liner were identified in the field and marked using steel bolts and yellow tape and are presented in Figure 2-1. BMSMC completed a Liner Damage Report for each tear. These reports are included in Appendix C and as indicated below in Table 2-2, all were due to excavation equipment and were likely not present prior to the biopile closure. All Liner Damage Reports were reviewed and approved by the Certification Engineer.

A total of 18 liner tears were observed and reported during the liner inspection and are summarized below in Table 2-2.

Table 2-2
Summary of Liner Damage Reports

Liner Damage Report Date	Tear #, Sample ID, and Size	Reason for Tear
2/20/2008	Tear # 1 Sample ID BL-1 2 feet by 1 foot (2' x 1')	Tear due to excavator
2/20/2008	Tear 2 Sample ID BL-2 1' x ½'	Tear due to excavator
2/20/2008	Tear #3 Sample ID BL-3 1' x 4'	Tear due to excavator
2/20/2008	Tear #4 Sample ID BL-4 1' x 5'	Tear due to excavator
2/20/2008	Tear #5 Sample ID BL-5 1 inch in diameter	Tear due to excavator
2/20/2008	Tear #6 Sample ID BL-6 1" puncture	Tear due to excavator
2/20/2008	Tear #7 Sample ID BL-7 1' x 1'	Tear due to excavator
2/20/2008	Tear #8 Sample ID BL-8 6 square inches (sq. in.)	Tear due to excavator

Liner Damage Report Date	Tear #, Sample ID, and Size	Reason for Tear
2/20/2008	Tear #9 Sample ID BL-9 3 inches in diameter	Tear due to excavator
2/20/2008	Tear #10 Sample ID BL-10 6 sq. in.	Tear due to excavator
2/20/2008	Tear #11 Sample ID BL-11 2" x 4"	Tear due to excavator
2/20/2008	Tear #12 Sample ID BL-12 1 sq. in.	Tear due to excavator
2/20/2008	Tear #13 Sample ID BL-13 3' x 4'	Tear due to excavator
2/23/2008	Tear #14 Sample ID BL-14 1 sq. in.	Tear due to excavator
2/25/2008	Tear #15 Sample ID BL-15 1 inch in diameter	Tear due to axe
2/25/2008	Tear #16 Sample ID BL-16 6 sq. in.	Tear due to excavator
2/25/2008	Tear #17 Sample ID BL-17 4"	Tear due to excavator
2/25/2008	Tear #18 Sample ID BL-18 1/2"	Tear due to excavator



LEGEND

- TEAR/RIP LOCATION

Approved By: Engineering Manager

[illegible]

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MALCOLM PIRNIE



Bristol-Myers Squibb Company
Humacao, Puerto Rico

title: BIDPILE DAMAGE LOCATIONS
project: INTERIM CORRECTIVE MEASURE
BUILDING 5 AREA
HUMACAO, PUERTO RICO

Location: BRISTOL-MYERS SQUIBB MANUFACTURING COMPANY
HUMACAO, PUERTO RICO

DATE:	APRIL 2008
SCALE:	1"=10'
PRJ MGR:	
DESIGNER:	
VENDOR NAME:	
AUTHOR:	

SHEET #:

BIOPILE REMOVAL
CERTIFICATION REPORT
FIGURE 2-1

DISCIPLINE:	6
SYSTEM:	
SYSTEM #:	
EQUIPMENT:	

CSI CATEGORY	
OBJECT NAME	
DOCUMENT TYPE	
DRAWING #	24516001.DWG
DOCUMENT STATUS	XXXXX
DEPARTMENT	



3. Summary of Soil Sampling Activities

3.1. Oversight of Soil Sample Collection

On March 4, 2008, AMAI collected confirmatory soil samples from beneath the footprint of the soil treatment cell location. MPPR was present during the soil sampling activities and observed AMAI personnel collect samples. As specified in the Work Plan, soil samples were collected from the 0.25 foot soil interval of the subgrade soil located directly beneath the biopile to determine whether operation of the biopile had impacted the underlying soil. The liner and the soil base that was placed over the liner were removed prior to collection of samples.

Soil sample locations were selected by AMAI as follows:

- A confirmatory soil sample was collected beneath each possible release point (i.e., each tear location) identified during the liner inspection for a total of 18 samples.
- The foot print of the biopile was divided into four quadrants. A soil sample was collected at the approximate center of each quadrant for a total of 4 confirmatory soil samples.

As required by the ICM Work Plan, Section 4.6.2, the samples were analyzed for volatile organic compounds; xylene, ethylbenzene and MIBK by EPA Method 8260. Accutest conducted the sample analyses. The laboratory analytical results are summarized in Table 3-1. The laboratory data sheets are included in Appendix E. Quality Assurance/Quality Control (QA/QC) samples were also collected, including: a trip blank, a field blank, an equipment blank, and a duplicate sample.

3.2. Laboratory Analytical Results

AMAI tabulated and summarized the confirmatory soil sample results presented as Table 3-1. Target cleanup levels are presented in Table 3-1. Sources of target cleanup levels are presented in the footnotes to Table 3-1. No issues were identified with the QA/QC sample results. The laboratory analytical results of the confirmatory soil samples indicated the following:

- Xylene – Below target cleanup levels.
- Ethylbenzene – Below target cleanup levels.
- MIBK – Below target cleanup levels.

Table 3-1
Soil Sampling Results
Biopile Closure
Bristol-Myers Manufacturing Company
Humacao, Puerto Rico

Sample ID	Direct Contact	Migration to	BP-1	BP-2	BP-3	BP-4	BP-4 D	BL-1	BL-2	BL-3
Sample Depth	Industrial	Groundwater	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Sample Date	RBSL 1	RBSL 2	4-Mar-08	4-Mar-08	4-Mar-08	4-Mar-08	4-Mar-08	4-Mar-08	4-Mar-08	4-Mar-08
Reporting units are in ug/kg.							Duplicate			
Ethylebenzene	4.0E+05	13,000	0.77 J	ND	ND	ND	ND	ND	ND	1,130
MIBK	4.7E+07	59,000	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes	4.2E+05	190,000	6.0	ND	ND	1.1 J	0.79 J	ND	ND	5,620
Any value exceeding SSLs are shown shaded.										

Sample ID	Direct Contact	Migration to	BL-4	BL-5	BL-6	BL-7	BL-8	BL-9	BL-10	BL-11
Sample Depth	Industrial	Groundwater	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Sample Date	RBSL 1	RBSL 2	4-Mar-08	4-Mar-08	4-Mar-08	4-Mar-08	4-Mar-08	4-Mar-08	4-Mar-08	4-Mar-08
Reporting units are in ug/kg.										
Ethylebenzene	4.0E+05	13,000	110	ND	ND	ND	ND	ND	ND	ND
MIBK	4.7E+07	59,000	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes	4.2E+05	190,000	285	ND	ND	ND	ND	ND	ND	ND
Any value exceeding SSLs are shown shaded.										

Sample ID	Direct Contact	Migration to	BL-12	BL-13	BL-14	BL-15	BL-16	BL-17	BL-18
Sample Depth	Industrial	Groundwater	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Sample Date	RBSL 1	RBSL 2	4-Mar-08	4-Mar-08	4-Mar-08	4-Mar-08	4-Mar-08	4-Mar-08	4-Mar-08
Reporting units are in ug/kg.									
Ethylebenzene	4.0E+05	13,000	0.83 J	ND	0.87 J	0.83 J	ND	ND	ND
MIBK	4.7E+07	59,000	ND	ND	ND	ND	ND	ND	ND
Xylenes	4.2E+05	190,000	ND	ND	1.6 J	2.2	ND	ND	ND
Any value exceeding SSLs are shown shaded.									

J - indicates an estimated value
ND - not detected

Notes:

1. Direct-contact Industrial RBSLs were obtained from EPA Region 9 PRGs (October 2004)
2. RBSLs are EPA soil screening levels (SSLs) for the migration to groundwater pathway for a dilution-attenuation factor (DAF) of 20. Where EPA SSLs were not available (i.e., MIBK), EPA Region III migration to groundwater SSLs were used (EPA, 2007).

4. Summary of Closure Activities

Closure activities were conducted in accordance with the Work Plan. All treated soil and associated equipment were removed in accordance with Section 4.6 of the ICM Work Plan.

The confirmation soil sampling results indicated no exceedences of target cleanup levels. No additional sampling is required beneath the former soil treatment cell.

5. Closure Certification

I, Jaime Abreu, hereby certify that I am of legal age and a resident of Trujillo Alto Municipality of Puerto Rico. I am a Professional Engineer authorized to practice in Puerto Rico with license number 16639.

I am the Professional Engineer designated by Bristol-Myers Squibb Manufacturing Company ("BMSMC") in Humacao, Puerto Rico to inspect and certify the closure activities associated with the Interim Corrective Measure, Building 5 Area (Biopile Removal).

The removal activities which included sampling and documentation processes were inspected by me. I certify that the activities were conducted in full compliance with the Work Plan and all applicable Federal and State Laws and Regulations. The closure achieved closure performance standards as set forth by 40 CFR 264.111; as such, the specifications of the approved Interim Corrective Measure Work Plan, Building 5 Area (Revision 1.0), Bristol-Myers Squibb Manufacturing Company, Humacao, Puerto Rico dated August 2004 are complete at this time.



6. References

Anderson Mulholland & Associates. 2004. *Interim Corrective Measure Work Plan Building 5 Area (Revision 1.0)*. Bristol-Myers Squibb Manufacturing, Inc., Humacao, Puerto Rico.